kirankumar.jasti@yahoo.com 09049782110

KIRAN KUMAR JASTI

Offering nearly 16.5 years of experience in Automotive Electrical Systems Design, Development & Embedded Systems Hardware

Visionary and strategic business leader with entrepreneurial drive, management skills and leadership competence in building organizational capabilities, people power, product & service propositions and leverage these, to generate high impact on revenues, growth, profits, and operational performance

Industry Preference: Automotive/ Off Road Vehicles

Location Preference: Chennai & Pune/ Overseas

Career Timeline

2003 - 2006
Efftronics Systems Pvt. Ltd., Vijayawada, AP as Senior Firmware Engineer

2006 -2008
Bajaj Auto Ltd., Akurdi, Pune as R&D Engineer

2008 – 2009
EATON Technologies, EON Free Zone, MIDC, Pune as Project Leader

2009 - 2011
Bajaj Auto Ltd., Akurdi, Pune as Asst. Manager

May'11 – Jan'19
Mahindra & Mahindra, Pune as Department Head

Jan'19-Current
ELGi Equipments Ltd RnD Head (E&E)

Key Impact Areas

- **Project Management**
- **New Product Development**
- **Designing & Developing New Technology**
- **Creating Intellectual Property Rights**
- **Product/ Process & People Management**
- **Cross-functional Coordination**
- **Hardware Programming**
- **Embedded System Design & Development**

Soft Skills

Executive Profile

- Hands-on experience in project life cycle management with application of automotive electrical & electronic systems
- Pivotal in developing new technology for latest regulatory requirements of **USA - Tier IV Final & Tier V,** including (Selective Catalytic Reduction), DEF (Diesel Exhaust Fluid) - Emission Regulations
- Headed plant quality & plant process and synergy with different aggregates Synergy with SQA (Supplier Quality Assurance), CDMM (component development), VI (Vehicle Integration) & ME (Manufacturing Engineering) enabling smooth integration of E&E components there by achieving design for Assembly, tact time and quality parameters
- Enriched exposure to design, validation, project coordination, process development & improvement, field failure simulation and solutions
- Excellence in designing & development of hardware system for consumer applications (electronics/ aerospace/ automotive)
- Exhibited excellence in identifying and implementing practices to reduce cost, increase revenue, improve business practices and drive growth
- Leveraged skills in coordinating benchmarking activities for Tractors (Off highway) vehicles and driving productivity improvement initiatives such as lean manufacturing, TQM, TPM and Kaizen
- Inspirational leader who drives a culture of success organization wide and values training to ensure associates consistently exceed expectations

Education & Credentials

B.Tech. (Electronics & Communication Engineering) from AVIT of Anna University, Chennai in 2003; scored 69%

Diploma in Computer Engineering from V.K.R & V.N.B Polytechnic, Gudivada, AP in 2000; scored 78.5%

Proficiency Forte

- Designing **Micro Controllers and Processor based Embedded Systems**
- Insightful understanding of **System Failure Mode Analysis using DFMEA, FMEA & FHA**

Selected Highlights & Contributions

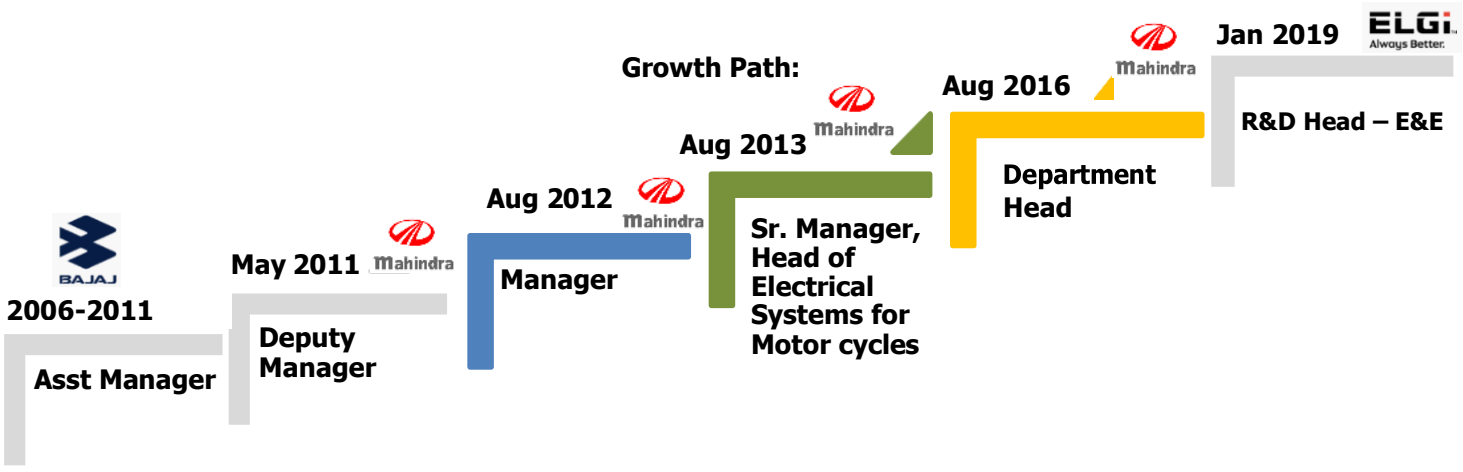
- Conferred with 2 Mahindra 'Rise' Awards for MEMs based Fuel Monitoring System and Invention of Ad-Blue Quality sensor with Integrated heater & received appreciation from Mr. Anand Mahindra in 2017 & 2013
- Received **'Expectation Surpassed'** rating - highest of Mahindra's ratings 5 years out of 7 years
- Bagged **consecutive promotions in consecutive years**
- Hold & filed **15 patents on various technologies**; 8 of these are in production.
- **2 SAE** papers selected in world congress and published
- Played a key role in completion of various projects encompassing:
  - Series Hydraulic Hybrid Systems (SHHS)
  - ePST (Electronic Power shuttle
  - EMS system for Tier IV final (Euro 6a)
  - Engine Control Unit (ECU) | Body Control Module (BCM)
  - intelligent CDI (iCDI), Immobizer Systems
  - RF Applications | BLDC & Stepper Motor Applications
- Credited for establishing synergy with Mahindra Sector Groups - (MUSA)/ (MTBD)/ Swaraj/ PTD (Power Train Division)/ Mahindra 2 Wheeler (MTWL)
- Expert and **Auditor** for Vehicle Safety (Includes - Electrical & Electronics system, Vehicle integration, Fuel/Oil systems, Hydraulics and plant manufacturing

Knowledge Purview

Systems:	Automotive Electrical Systems & Components (Magneto, RR Unit, Battery, Starter Motor, EFI System, Speedometer, Lighting Systems), Homologation requirements, Automotive standards Engine Management System (EMS), Body Control Modules, Emission regulation systems and sensors
Circuit Design:	Analog, Digital, High Frequency Signaling, Power Drivers, DC-DC Converters, Boost Converters, BLDC (Closed Loop System) & Stepper Motor Control, Thermal Profiling, PCB Design, EMI/EMC, BOM, Simulators, Signal Integrators, PCB 3D Design
Software:	Embedded C, Assembly-Device Drivers and Application Level, Keil Compiler
Process:	Six – Sigma, SIL Level Architecture Design
Standards:	Automotive IS & JIS, CENELAC, IEC 61508-Functional Safety
Micro Controllers:	Infineon Family (16bit-XC167 and XC164), PIC Controllers & Motorola 68000 Processor (32-bit Processors) Renesas RL78 controller, Freescale, ST and TI controllers
Bus Standards:	CAN, KWP2000, Diagnostic tools and DSM development for complex systems
Tools:	Altium Designer for PCB Designing, Hardware Simulators & Signal Integrators, DFMEA, FMEA & FHA, Debuggers, Emulators, CAN Analyzers (CAN King), Logic analyzers, Oscilloscope (Yokogawa 16-channel), Orcad. Expertise in Team centre (Siemens),Capital H, Adrino development software and knowledge on UG
Concepts:	RTOS, Diagnostic & EOL development, Emission regulations of different countries.

Professional Experience

Jan'19 – Current; ELGi Equipment Ltd as RnD Head – E&E



Role:

- Leading a team of 35 people; in the role of RnD Head - Electricals & Electronics
- Ensuring country wise Certifications for emissions, UL, CE and Electric Motor energy efficiency requirements
- Design Architect for IOT (Internet of Things) for failure prediction, System Optimal utilization and Fault Diagnosis
- Strategic development of **V**ariable **F**requency **D**rive(VFD) for driving electric motors
- Development of motors (3.5KW to 350KW),drive and system integration
- Designing & Development of new tech & creating intellectual property rights
- Liaising with production plant for pre-pilot, pilot & Seeding built, warranty analysis & managing customer complaints Managing all electronics functions; collaborating with CFT Team; managing and working in collaboration with different teams
- Developing:
  - Embedded system products including writing requirements, standards, manuals, test procedures and test reports for such products
  - Embedded hardware products including design, prototyping, testing, debug Board-level mixed signal circuit design, component selection and schematic development
  - Control system development comprising software logics, operating systems & standards
- Ensuring product reliability by DVP's (Design Verification Plan), DFMEA, DFA & DFS
- Monitoring project progress as per scheduled deadlines for various tasks and taking necessary steps to ensure completion within time, cost and effort parameters

Previous Experience

May'11 – Jan'19
Mahindra & Mahindra Ltd, as Department Head

Oct'09 - Apr'11
Bajaj Auto Ltd., Akurdi, Pune as Asst. Manager

Dec'08 – Sep'09
EATON Technologies, EON Free Zone, MIDC, Pune as Project Leader
Project funded by US Government

Dec'06 – Nov'08
Bajaj Auto Ltd., Akurdi, Pune as R&D Engineer

Aug'03 – Nov'06
Efftronics Systems Pvt. Ltd., Vijayawada, AP as Senior Firmware Engineer

Personal Details

Date of Birth: 2nd October, 1977
Languages Known: English, Hindi, Telugu, Tamil & Marathi
Present Address: Flat No: 1-3B, Sreerosh Freedom Square,G.V Residency,Coimbatore, Tamil Nadu - 603002
Permanent Address: H. No.: 1-167, Guntupalli (Post), Ibrahimpatnam (Man), Krishna (Dist.), Vijayawada, Andhra Pradesh

Please refer to the Annexure for Project Details

ANNEXURE
Projects Handled

Client: **ELGi Equipments Ltd | IoT system for Failure detection & Prediction (Artificial intelligence, Knowledge and Machine learning algorithms).**

Title: **Air~ALERT** System
Role: RnD Head – E&E Team Size: 35
Description: AiR~ALERT is an IoT system developed to detect and predict failure of air compressors. Air compressors are primary source of energy to run tools of manufacturing industries, food processing industries, railways, medical equipments etc. **Uptime** being the most important characteristics of compressor, **C**ompressor **C**ontrol **U**nit (CCU) monitors different parameters of compressor and info is passed to IoT cloud through **edge computing capable gateway**.

In the current configuration, data from compressors (50k machines (@50MB/machine) spread across 112 countries) are brought to IoT cloud platform. Data analytics performed with the help **rules** executed on **streaming database** and is stored in **influx** database. Outcome of rules are given as **alerts** to customers when failure is detected/predicted.

3 major components involved. Edge capable Gateway (In-house development), Communication network (Sierra wireless system) and IoT cloud platform (developed along with PTC)

Highlights: Current accuracy achieved is 65%. As the data size and period increases, machine learning algorithms are tuned for an accuracy of 95%.

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Client: **Mahindra & Mahindra | Fuel Injection System, Tier Iv Emission Systems (BS6/Euro 6), Tiretronics, Data Mining, Multiplexing etc.**

Title: **Engine Management System for Tier IV final (Euro 6) for Mahindra USA tractors**
Role: Department Head Team Size: 22
Description: Tier IV final is the highest level of emission regulation available across the globe currently.

This is applicable for all tractors (Off- highway) greater than 75hp. As part of regulation, Nox and Particulate matter to be controlled to near zero (0.01 g/bHp-Hr). A closed loop loop system developed with NoX sensor and controller. DPF (Diesel particulate filter) ensures PM is filtered out. Feedback from NoX sensor is used to doze required quantity of Ad-blue in to SCR (**S**elective **C**atalytic **R**eduction). SCR ensures NOx converts in to Nitrogen and H2O. Nitrogen is absorbed and water is released through exhaust.

Developed a Quality sensor that detects quality of DEF being dozed in to SCR system. This has integrated heater that enables SCR system to work at temperatures below -8 degrees

Highlights: Patent granted for quality sensor with integrated heater. Received **'Mahindra Rise award'** that helped cost reduction by a major margin apart from reducing system redevelopment.

Title: **Tiretronics**
Role: Department Head Team Size: 18
Description: Tiretronics is a tire pressure management system. For Off road vehicles (Tractors) pressure inside tire is very important depending on field implement and application. To enable this, a Bluetooth sensor is packaged in to each tire and it directly communicates with mobile. Tractor system is also enabled to receive Bluetooth sensor information on to on-board controllers. Based on the application/implement customer uses, it will alarm for adequacy of pressure (To be increased or reduced).

Next phase (In-progress) of development includes a compressor associated with tractor engine. This compressor maintains request pressure in tire either by pumping or escape valve.

Highlights: Most important use case for tractor applications. First in industry feature. Completed POC for phase1 and Phase2 in progress

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Title: **ePST (Electronic Power Shuttle Transmission)**

Role: Department Head Team Size: 18

Description: Power shuttle is used to ease driver by not require changing gears frequently. ePST is an advanced system compared to synchronous shuttle which gives modulated output to actuators inturn controlling hydraulic fluids. These engage set of gears with needed filtering/dampening (~1.5 sec) thus controlling the jerk effect/ Rubber band effects. Included functions as part of ePST are automatic **4WD**, **Differential lock**, **Quick turn** and **Auto Levelling**

Highlights: Includes sensors for detecting tractor speed, wheel angle sensors, steering feedback, pressure feedback sensors along with several engine parameters from Engine management system over CAN (J1939). ePST build around freescale controller. Includes development of DSM and diagnostic tool over **UDS**.

Title: **Remote Diagnostic system**

Role: Department Head Team Size: 18

Description: Developed for Mahindra Global tractor platforms (Mahindra, Mitsubishi Agri & TYM)

With stringent emission norms, more and more electronic systems on tractor. Unlike Automotive, tractors cannot be taken to service hubs frequently due to slow moving vehicles and loss of machine hours which is directly calculated as a loss. In its normal form, tractor needs to come service station (May be in truck if issue disables tractor movement). Diagnostic tool connected and DTC errors are resolved. In improved system, customer needs to only sink his mobile to on-board Bluetooth system. All DTC information of tractor is taken to mobile and is uploaded in to cloud. This alerts proximity dealer about the fault and information to the user on his mobile with service contact numbers. As an additional advantage, issues in perview of customer handling, step by step manual appears on the mobile based on DTC reported. For errors beyond this, dealer shall give step by step guidance to customer

Highlights: System is even enabled to connect to cloud, check for updates pertaining to tractor model and ECU hardware available & flash latest versions. A very useful & value proportionate to customer.

Title: **Intelligent Control Unit & Ignition System**

Role: Manager Team Size: 3

Description: System incorporates features like immobilizer, RF communication and Head Lamp controller

Immobilizer: Built around Philips chip set platform and is used as vehicle antitheft and immobilization

RF communication: Used as a function of '**Lead Me to Vehicle**' and helps in locating vehicle from a distance

Head Lamp controller: Built to disable Head Lamp in day condition and also acts as a **'Follow me Lamps'** in Night condition to illuminate vehicle surroundings

Highlights: **Filled 5 patents** in designing and developing all features are first movers in Indian Automotive Industry

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Title: **Design of MEMS Based Fuel Sensor**

Role: Sr. Manager Team Size: 3

Description: For conventional fuel tanks, fuel is measured using a float based fuel sensing system. This gives resistance as per the existing fuel inside the tank. But, for non-conventional fuel tanks, fuel sensing is not accurate or sensing is possible for only 60% of full capacity of fuel tank.

A piezo electric fuel sensing is designed to cater for non-conventional fuel tanks. This senses pressure available in the fuel tank and voltage is given as per the fuel quantity in the tank. Voltage is converted in to the respective fuel quantity and is displayed on the speedometer with help of software which includes number of algorithms for filtering and fluctuation dampening. This sensor is **one of its kind in Auto industry globally**

Highlights: Filled 2 patents for fuel sensor and algorithm in speedometer

Merit of getting innovation selected in **SAE World Congress**

Received '**Mahindra Rise Award**'

Title: **Intelligent Control Unit & Ignition System**

Role: Sr. Manager Team Size: 3

Description: System incorporates features like immobilizer, RF communication and Head Lamp controller

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Highlights: **Filled 5 patents** in designing and developing all features are first movers in Indian Automotive Industry.

Title: **Distance to Empty (DTE) for non-FI systems (Patented)**
Role: Sr. Manager Team Size: 3
Description: Conventionally, 'Distance to Empty' is calculated for ECU based system only accounting Fuel valve opening timing. New fuel sensor is designed and developed to cater DTE function. Sensitivity of the sensor is increased by patented technology and is suitably supported by the software for its functionality
Highlights: Provisional Patent Filled

Title: **CDI**
Client: Bajaj Auto Ltd.,
Role: Asst. Manager Team Size: 5
Description: Capacitive discharge ignition is required for High speed engines where the charging time is less. iCDI is an extension to the normal capacitive discharge ignition used in the automotive with the additional functionalities of Idle start stop control, UDS on CAN and KWP2000
Deliverables: Design of system around Infineon XC2765 (16-bit) micro controller, interfacing of different types of Analog, Digital and PWM sensors so as to achieve the system functionality, building of SMPS circuit for capacitive discharge ignition that converts board voltage (12V) to 250V which in turn converts in to 20KV at the secondary of the spark plug coil, Immobilizer circuit design and interfacing it to XC2765
Environment: Altium Designer for circuit design and development, Hardware Simulators, Signal Integrators and bench testing; DFMEA tools, Thermal profiling for switching MOSFET

Title: **Series Hydraulic Hybrid Systems (SHHS)**
Client: EATON Technologies
Role: Project Leader Team Size: 6
Description: The project dealt with designing a system with an objective of increasing the fuel efficiency over 50%. It was one of the prestigious projects supported by US government and Environment Protection Agency (EPA).
Deliverables: Designed circuit for power PCS ECU. Performing DFMEA, FMEA and FHA (Fault Hazard analysis). Conducted Software architecture design for Power Control System (PCS) ECU and Observer Module ECU (Round Robin with interrupt architecture). Reviewing quality deliverables from the team and project tracking.
Environment: Altium Designer for circuit design and development, Hardware Simulators, Signal Integrators and bench testing; DFMEA tools

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Title: **Engine Control Unit (ECU)**
Client: Bajaj Auto Ltd.
Role: R&D Engineer Team Size: 9
Synopsis: The project aimed at the most sophisticated electronic system to measure and control part or all of the engine parameters. It was an embedded system, built around Infineon XC167 16-bit Micro Controller Architecture.
Deliverables: Condcted Electronic Hardware Design & Development which included ADC, Digital circuitry, High frequency signal processing, Power drivers for Injectors (Fuel, Air), HT coil Drivers, signal conditioning and filtering
Environment: Onsite working for design of basic system architecture at ORBITAL Australia Pty. Ltd., Australia. Onsite working with NOVOTECHNIK, a leading sensor manufacturing company in Germany for studying the different types of sensors. Rhapsody for Architecture design. Hardware analysis & design. Multi-layer (four layer) PCB design using Altium Designer, Simulators, Signal Integrators, Performance and Endurance test set-ups
Operating System: Built around Infineon XC167 16-bit Microcontroller, in Round robin with interrupts Architecture. Performed the scheduling related activities and handled interrupts. Functionalities include handling call back functions from control strategies and controlling device drivers through API's
Hardware: Inputs such as Analog, Switch and Frequency. These are filtered (for RF and noise), loaded with protective features for securing Microcontroller in events of Short circuits and biased for respective thresholds. Drivers for actuators are designed to withstand in the toughest Electrical and atmospheric conditions at which the system is targeted for along with Diagnosis features such as open circuit, over temperature, short to battery and short to ground related faults

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Title: **Body Control Module (BCM)**
Client: Bajaj Auto Ltd Team Size: 5
Deliverables: Design of Distributed Hardware architecture (Door modules and Router unit) with CAN based communication between them. Driving of several motors (BLDC and Stepper), Inductive loads, High frequency signals, and RF modules for Tire pressure monitoring are part of Hardware design architecture.
Environment: Altium Designer for designing and developing the entire Hardware architecture. Simulators and Signal Integrators for testing and validating the hardware for first level, Functional and Endurance test
System Components:
Operating System: Build around Infineon XC167 16-bit Microcontroller, in Round robin with interrupts Architecture
System Application: Lighting System (Central BCM); Central Locking System; Power Windows; Head Lamp Control; Wiper Control; Side Mirror control; Tire pressure Monitoring System and Immobilizer
Hardware: Power drivers, RF modules and communication channels. H-Bridges along with MOSFETs for driving the Motors (Central Locking System, Power windows, Head Lamp control and Wiper control applications), Multichannel drivers for Lighting applications, TransReceiver Module which operates at 433 MHz for immobilizer and Tire pressure monitoring (in progress) application.

Title: **BLDC & Stepper Motor Applications**
Client: **Bajaj Auto Ltd.** Team Size: 2
Deliverables: Stepper motor drive using discrete components (set of 6 FET's for driving a stepper motor) in an open loop system. Driving of BLDC motor in a closed loop system by introducing feedback sensors (3 feedback sensors one at every electrical 60°) in the stator. Software development in MPLAB environment
Environment: MPLAB in 'C' language; Motor control drivers (BLDC); Simulators & Signal Integrators Supported by Altium and hardware testing on Bench and Prototype testing on vehicle
System Components:
Software: Build around Microchip 16F785 8-bit Microcontroller, in interrupt Architecture. It is a closed loop system, taking feedback from Hall sensors and using them for fetching next sequence from the vector table. Had over voltage and over current protection features embedded in the software.
Hardware: Power drivers for driving the BLDC and Stepper motors. Hardware is complimented with diagnosis facility for Over current and Over voltage protection

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Client: **Indian Railways**
Title: **Block Instrument** – Fail Safe system (3 out of 2 controls) Team Size: 10
Deliverables: Scanned digital inputs for every 8ms. Packets generation and communication and user interface with LED and LCD's
Environment: MicroTek compiler in 'C' language; packet generation, 16byte FIFO; LCD drivers; Hardware testing on bench and prototype testing
System Components:

- 2 out of 3 architecture | Built around Motorola 68000 (32-bit) processor
- Self-developed communication protocol for protection features | LCD's for user interface
- LED's defining system functionality | Keyboard for keying in data

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Title: **Real Time Passenger Information System** Team Size: 7
Deliverables: Designing whole system software with customer interaction. Hardware testing at ETDC, Chennai and pre-site inspection for installation.
Environment: 68000 processor based system with RTC and leased line modem.
Title: **Datalogger** Team Size: 9
Deliverables: Design & development of system functionality. Developing communication, data processing & user interface modules. Post project analysis after installation of system for field trail.

Other Key Projects:
Client: **Indian Railways**
Title: RACK Model Relay Model | Team Size: 6
Title: Station Arrival Indicator | Team Size: 4
Title: 8 Port Communication for FEP | Team Size: 2
Title: Processor Card | Team Size: 2
Client: **R&D project**
Title: Intelligent Distributed Light Controller System | Team Size: 4